

CLAIMS

1. A wireless communication system comprising a base station and an associated station for conducting wireless
5 packet communications,

wherein the base station and the associated station have each a plurality of antennas,

wherein the base station comprises:

base station antenna selection means for selecting
10 a packet transmit antenna from among the plurality of antennas;

antenna selection control means for specifying the antenna to be selected by the base station antenna selection means based on quality information of each
15 transmission path established between the plurality of antennas and the antenna selected from among the plurality of antennas of the associated station; and

transmit control means for transmitting a packet to be transmitted to the associated station from the
20 antenna selected by the base station antenna selection means, and

wherein the associated station comprises:

associated station antenna selection means for selecting one antenna from among the plurality of
25 antennas;

receive means for receiving the packet through the antenna selected by the associated station antenna selection means; and

5 antenna switch control means for controlling so as to switch the antenna selected by the associated station antenna selection means to a different antenna in response to receiving the packet by the receive means.

2. The wireless communication system according to claim 1,
10 wherein the base station comprises transmit power control means for controlling transmit power of the packet based on the quality information.

3. The wireless communication system according to claim 1
15 or 2,
 wherein the associated station comprises:

 selection probability storage means for storing the selection probability indicating what probability each of the plurality of antennas is to be selected at;
20 receive quality information storage means for storing receive quality information associating the receive quality of the packet received at the receive means and the antenna receiving the packet with each other; and

25 selection probability update means for updating

the selection probability based on the receive quality information, and
wherein the antenna switch control means determines the different antenna based on the selection probability.

5

4. The wireless communication system according to any of claims 1 to 3,

wherein the base station comprises space-time coding means for performing space-time coding of the packet to 10 generate a plurality of coded packets,

wherein the base station antenna selection means selects as many antennas as the number responsive to the number of the coded packets,

wherein the transmit control means transmits the 15 plurality of coded packets from the selected antennas to the associated station at the same time, and

wherein the associated station comprises combining means for combining the plurality of coded packets received in the receive means.

20

5. The wireless communication system according to any of claims 1 to 4,

wherein the base station comprises RSSI estimation means for estimating RSSIs of the packets received through the 25 plurality of antennas from the antenna selected by the

associated station antenna selection means, and
wherein the quality information is the estimated RSSI.

6. The wireless communication system according to any of
5 claims 1 to 4,

wherein the packet contains a response request packet
for making a request to send a receive response of the packet
and a data packet,

10 wherein at the packet communication start time with the
associated station, the transmit control means transmits the
response request packet to the associated station from the
antenna selected by the base station antenna selection means,

15 wherein the associated station receives the response
request packet by the receive means and transmits a response
packet of a response to the response request packet to the base
station from a different antenna to which the antenna is
switched by the antenna switch control means,

20 wherein the base station comprises RSSI estimation means
for estimating RSSIs of the response packets received at the
plurality of antennas,

wherein the quality information is the RSSI, and

25 wherein the transmit control means transmits the data
packet to the associated station from the antenna selected by
the base station antenna selection means according to the
specification based on the quality information.

7. The wireless communication system according to claim 6,
wherein the data packet contains the response request
packet.

5

8. The wireless communication system according to any of
claims 1 to 7,
wherein the plurality of antennas of the base station
and the associated stations have different characteristics.

10

9. A wireless station for conducting wireless packet
communications with an associated station, the wireless
station comprising:

a plurality of antennas;
antenna selection means for selecting a packet transmit
antenna from among the plurality of antennas;
antenna selection control means for specifying the
antenna to be selected by the antenna selection means based
on quality information of each transmission path established
between the plurality of antennas and the antenna selected from
among a plurality of antennas of the associated station; and
transmit control means for transmitting a packet to be
transmitted to the associated station from the antenna selected
by the antenna selection means,

25

wherein the antenna selected from among the plurality

of antennas of the associated station is switched to a different antenna each time the packet is received in the associated station.

5 10. The wireless station according to claim 9, comprising:
 transmit power control means for controlling transmit
 power of the packet based on the quality information.

10 11. The wireless station according to claim 9 or 10,
 comprising:

 space-time coding means for performing space-time coding
 of the packet to generate a plurality of coded packets,
 wherein the antenna selection means selects as many
 antennas as the number responsive to the number of the coded
15 packets, and

 wherein the transmit control means transmits the
 plurality of coded packets from the selected antennas to the
 associated station at the same time.

20 12. The wireless station according to any of claims 9 to 11,
 comprising:

 RSSI estimation means for estimating RSSIs of the packets
 received through the plurality of antennas of the wireless
 station from one antenna selected from among the plurality of
25 antennas of the associated station,

wherein the quality information is the estimated RSSI.

13. A wireless station for conducting wireless packet communications with an associated station, the wireless station comprising:

a plurality of antennas;

antenna selection means for selecting one antenna from among the plurality of antennas;

receive means for receiving a packet transmitted from
10 a packet transmit antenna selected from among a plurality of antennas of the associated station through the antenna selected by the antenna selection means; and

antenna switch control means for controlling so as to switch the antenna selected by the antenna selection means to
15 a different antenna in response to receiving the packet by the receive means.

14. The wireless station according to claim 13, comprising:

selection probability storage means for storing the
20 selection probability indicating what probability each of the plurality of antennas is to be selected at;

receive quality information storage means for storing receive quality information associating the receive quality of the packet received at the receive means and the antenna
25 receiving the packet with each other; and

selection probability update means for updating the selection probability based on the receive quality information,

wherein the antenna switch control means determines the
5 different antenna based on the selection probability.

15. The wireless station according to claim 13 or 14,
wherein the packet transmitted from the associated
station is a plurality of coded packets generated by performing
10 space-time coding of the packet, and

wherein the wireless station comprises combining means
for combining the plurality of coded packets received in the
receive means.

15 16. The wireless station according to any of claims 9 to 15,
wherein the plurality of antennas have different
characteristics.